The Association for Information Systems & Temple University, Fox School of Business

INFORMATION SYSTEMS JOB INDEX *2015*

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Learn About Careers in Information Systems

ASSOCIATION FOR INFORMATION SYSTEMS

Fox School of Business
TEMPLE UNIVERSITY®

INFORMATION SYSTEMS JOB INDEX *2015*

About the Report

The **AIS-Temple Fox School Job Index**, which is the only systematic assessment of the IS job market, is a joint five-year project to produce reliable national-level data on placement, type of jobs, satisfaction, and related factors, such as career services, knowledge level, preparedness, and search strategies.

Learn more at isjobindex.com

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Published by the:

Association for Information Systems
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Published in the United States
First Publication: April 2016

Report Highlights

STUDENT HIGHLIGHTS

- *Page 14:* The **highest paying industries** were information technology consulting and software development.
- *Page 18*: **Successful applicants** spent more time at **job fairs** and on their **resumes**.

PARENT HIGHLIGHTS

- *Page 10*: Check out whether adding a **second major or minor** impacts **salary offers**.
- *Page 21:* See how **skills** and **knowledge** impacted **offers**.

FACULTY HIGHLIGHTS

- *Page 18*: Departments with student organizations, resume books, and career counseling had **higher placement rates**.
- *Page 20:* Students knew the **least** about **data security and infrastructure**.

EMPLOYER HIGHLIGHTS

- *Page 14:* Compare **what you offer** to **typical salaries** in your industry.
- *Page 11*: **85%** of students agreed that the offer they accepted had a **good work-life balance**.

2015 IS Snapshot

About the IS Industry

Information Systems (IS) professionals, who apply and develop Information Technology (IT) in organizations, now comprise a significant portion of the IT labor market.

WHO ARE THESE PROFESSIONALS AND WHAT DO THEY DO?

- System and Business Analysts
- Application & Software Developers
- Data Analysts
- Chief Information Officers (CIO) & Chief Technology Officers (CTO)

They focus on **technology** and a domain of application and are experts in strategizing, developing, applying, modifying, and sustaining technology to **solve problems** or leverage new IT enabled opportunities. IS professionals work with and rely on computer scientists and engineers to create platforms and focus on understanding requirements and integrating technologies to **design solutions** that solve practical day-to-day problems and increasingly, **lead digital innovation**.

The 2015 IS Job Market is *Very* Healthy

Job Placement Rate at Graduation

Bachelor's: **80%**

Master's: **65%**

73% of students are **moderately or extremely confident** about the job market.

Bachelor's in IS

A bachelor's in IS is in the **top 5 business degrees** and **top 10 degrees overall** demanded by employers. (Nace, 2016)

Master's in IS

A master's in IS is among the **top 10 graduate degrees** demanded by employers. (Nace, 2016)

ABOUT THE IS JOB MARKET

In 2015, there were an estimated 3 million jobs in the U.S. relevant to IS.

There are approximately **1,300 IS programs** in the U.S., which are typically offered in **Business Schools**, as well as in a few standalone Information Schools or integrated with Computer Science. IS programs are classified as **STEM** and are typically called:

- Management Information Systems (MIS)
- Information Systems (IS)
- Computer Information Systems (CIS)

The recruitment, mindset, education, demographics, career paths, skills, and jobs of IS professionals are different and yet remain poorly understood and rarely promoted. Despite its large and growing size, the IS labor market is largely 'hidden' because it is mixed with computer scientists and computer engineers.

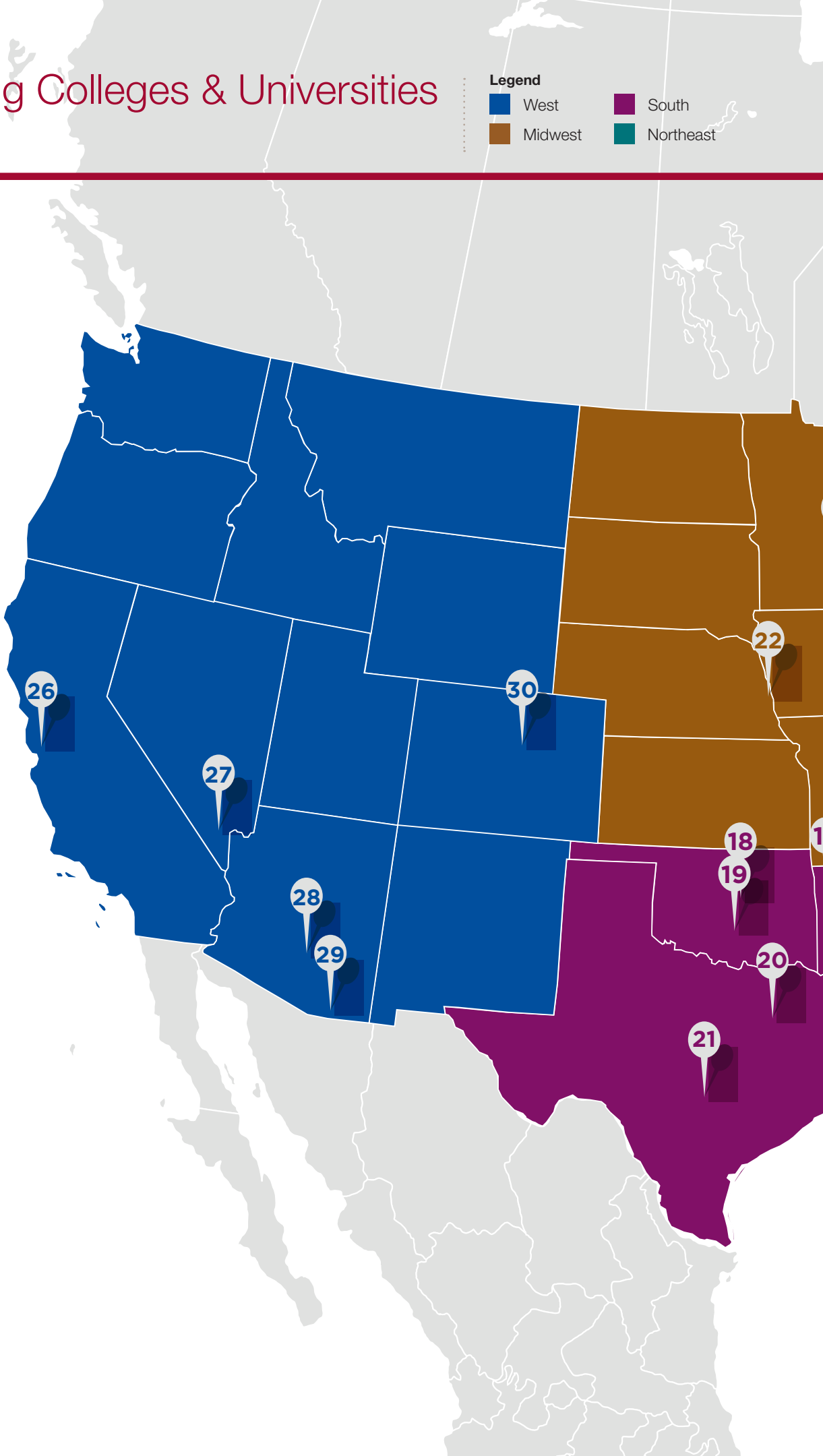
Average Salary

Bachelor's: **$57,817**

Master's: **$67,632**

Students are **better prepared** in every key knowledge area compared to 2013.

Participating Colleges & Universities
by REGION



West

26 SAN JOSÉ STATE UNIVERSITY

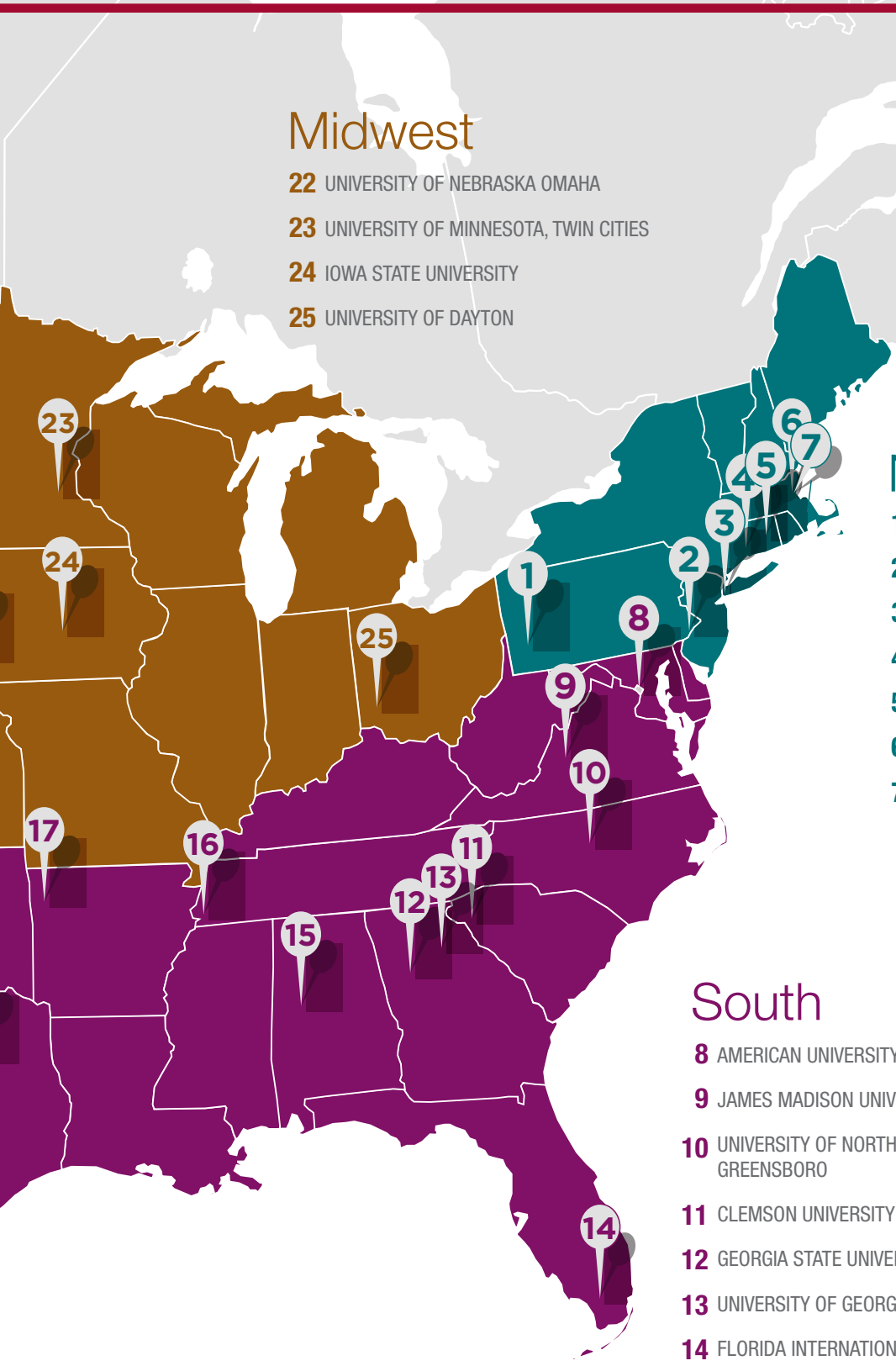
27 UNIVERSITY OF NEVADA, LAS VEGAS

28 ARIZONA STATE UNIVERSITY

29 UNIVERSITY OF ARIZONA

30 UNIVERSITY OF COLORADO, DENVER

Thanks to the 30 universities and colleges across the nation that agreed to administer the survey and provide data.



Midwest

22 UNIVERSITY OF NEBRASKA OMAHA

23 UNIVERSITY OF MINNESOTA, TWIN CITIES

24 IOWA STATE UNIVERSITY

25 UNIVERSITY OF DAYTON

Northeast

1 CARNEGIE MELLON UNIVERSITY

2 TEMPLE UNIVERSITY

3 BARUCH COLLEGE

4 CENTRAL CONNECTICUT STATE UNIVERSITY

5 UNIVERSITY OF CONNECTICUT

6 BENTLEY UNIVERSITY

7 BOSTON COLLEGE

South

8 AMERICAN UNIVERSITY

9 JAMES MADISON UNIVERSITY

10 UNIVERSITY OF NORTH CAROLINA, GREENSBORO

11 CLEMSON UNIVERSITY

12 GEORGIA STATE UNIVERSITY

13 UNIVERSITY OF GEORGIA

14 FLORIDA INTERNATIONAL UNIVERSITY

15 THE UNIVERSITY OF ALABAMA, TUSCALOOSA

16 UNIVERSITY OF MEMPHIS

17 UNIVERSITY OF ARKANSAS

18 OKLAHOMA STATE UNIVERSITY

19 UNIVERSITY OF OKLAHOMA

20 UNIVERSITY OF TEXAS, DALLAS

21 UNIVERSITY OF TEXAS, AUSTIN

Profile of an IS Student
FAST FACTS

Based on **1680+ respondents** from **30+ universities** across the nation.

A quick look at the
2015 Graduating Class

UNDERGRADUATE
Age 23

3 Years of Experience

1 Internship

GRADUATE
Age 28

5 Years of Experience

1 Internship

In 2015, the graduating class of IS students is still **predominantly male.**

The percentage of female graduates in IS is lower than

OVERALL IN THE U.S. Bachelor's: 52% | Master's: 59%*

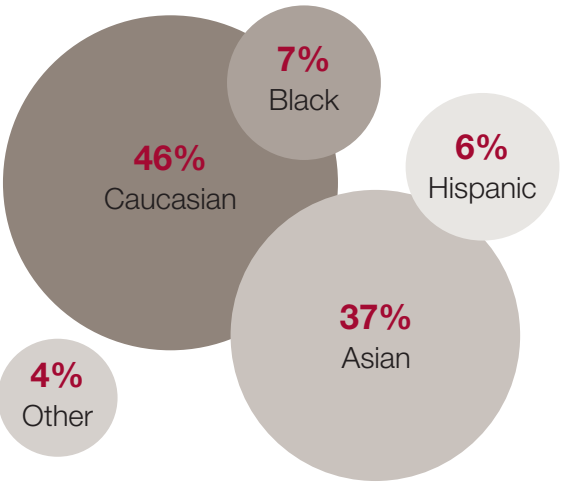
AMONG BUSINESS SCHOOL GRADUATES: Bachelor's: 43% | Specialized Master's: 47%**

Higher than the percentage of female graduates in

COMPUTER SCIENCE Bachelor's: 18% | Master's: 20%***

*US Census Bureau, College Enrollment Status, October 2014 ** AACSB, North American Females, 2012-2013 ***NSF, 2012

In 2015, the graduating class is predominantly **Caucasian** and **Asian.**



Read more about how IS students' ethnicities compare to other fields **on page 13.**

PLACEMENT^

At graduation:

Bachelors: 80%

Masters: 65%

Six months after graduation:

Bachelors: 89%

Masters: 94%

^ These percentages are based on self-reported data that reflects the student's job status at the time the survey was completed. The survey was open for three weeks during April-May 2015 and was sent out by each participating university to its list of graduating students and recent graduates. It is likely that many of the students graduating in May 2015 continued to look for jobs and received offers after the survey cut-off date.

Salaries & Offers

The average offer **increased** for both bachelor's and master's students from 2013 to 2015.

Bachelor's

2013 $57,212

2015 $57,817

17% higher than the average offer to business school graduates at **$49,536** (Nace, 2015)

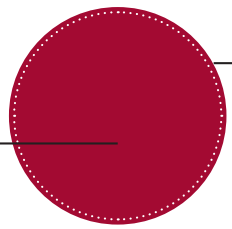
Master's

2013 $65,394

2015 $67,632

17% higher than the average offer to business school graduates at **$58,026** (Nace, 2015)

Adding a **Second Degree** or **Minor** to a bachelor's degree had only a small effect on salary average.



$58,311

Average Salary **without** a Second Major or Minor

$58,722

Average Salary **with** a Second Major or Minor

A **master's** degree nearly doubled a bonus.

Bachelor's

2015 $6,525

65% higher than the average signing bonus for graduates with bachelors' degrees in business at **$3,958** (Nace, 2016)

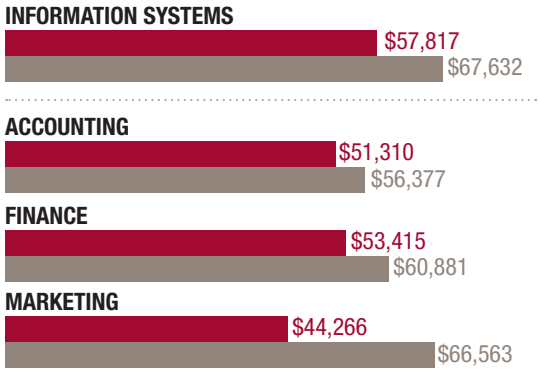
Master's

2015 $10,560

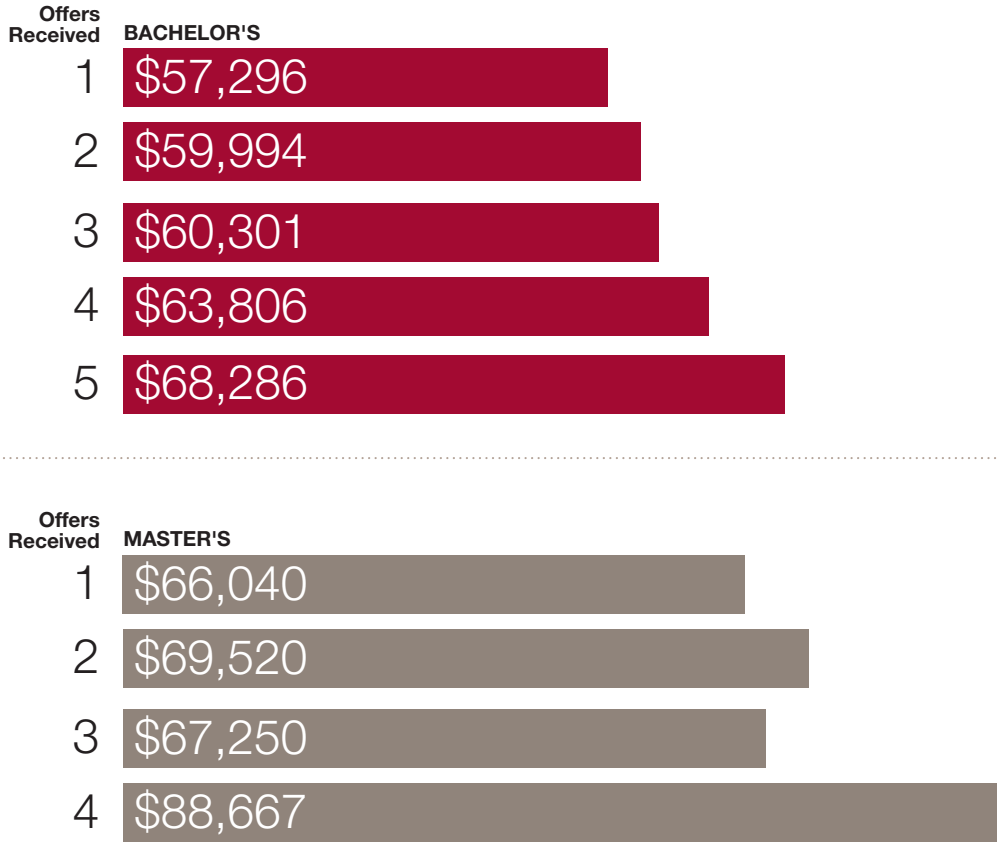
Salaries for IS graduates **are higher than typical business majors** for both bachelor's and master's degrees.

(Nace, 2015)

Legend: Bachelor's Master's



As the amount of offers **increased**, the average salary **also increased**.

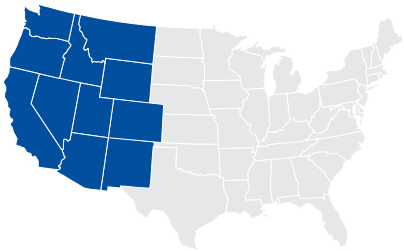


Over **75%** of students strongly or moderately **agreed** that their job was a **good fit** for them.

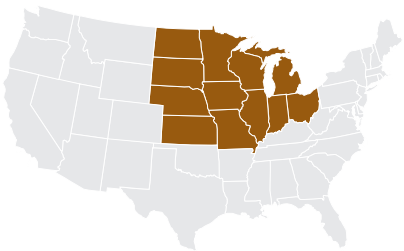
85% of students stated that the offer they accepted had a **good work-life balance**.

Salaries & Offers
by REGION

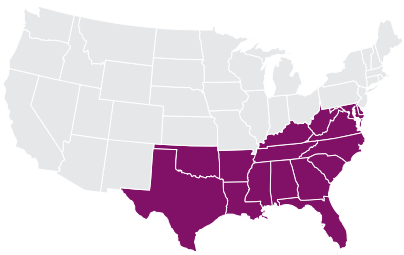
Legend
- Bachelor's
- Master's



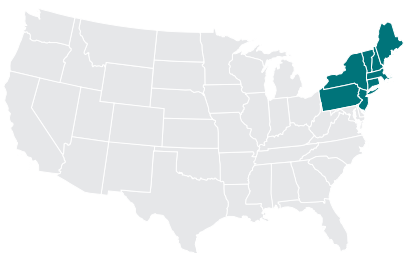
REGION		2013 % Change
WEST		
	$53,857	-5%
	$73,641	+10%



MIDWEST		
	$56,974	+5%
	$64,200	+1%



SOUTH		
	$59,144	+1%
	$62,666	-8%



NORTHEAST		
	$63,041	+9%
	$78,874	+43%

Master's students in the Northeast saw the **largest percentage increase** in their salaries, at 43% versus 2013.

Bachelor's students in the West and master's students in the South saw **decreases in salary amounts**, by 5% and 8% respectively.

Salaries & Offers
by ETHNICITY & GENDER

Legend
Bachelor's
Master's

About the Data: Ethnicities with 10 or more respondents are listed.

ETHNICITY

HISPANIC
$55,165
$55,940

CAUCASIAN
$58,289
$70,710

ASIAN
$61,300
$70,753

OTHER
$59,601
$55,283

AVERAGE 2015 SALARY BY GENDER
Bachelor's & Master's Students

BACHELOR'S STUDENTS
MALE $58,880
FEMALE $57,960

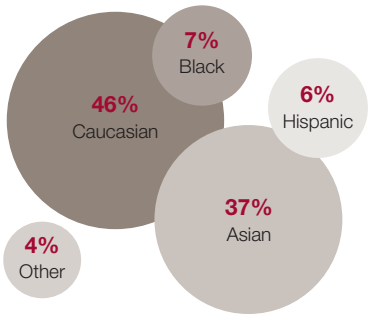
MASTER'S STUDENTS
MALE $72,001
FEMALE $63,206

Caucasian and Asian master's students garnered the highest salaries. In addition, there is still evidence of a glass ceiling, with male students earning higher salaries than female students, especially at the graduate level.

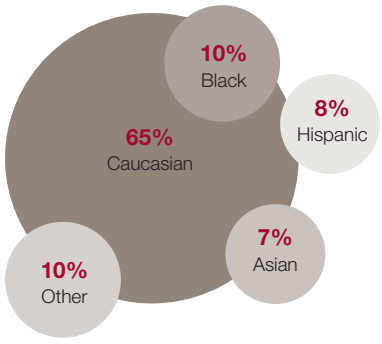
ETHNIC BREAKDOWN OF IS GRADUATES VS. OTHER GRADUATES
Bachelor's Students

IS graduates are **more ethnically diverse** than college graduates in general and computer science graduates in the U.S.

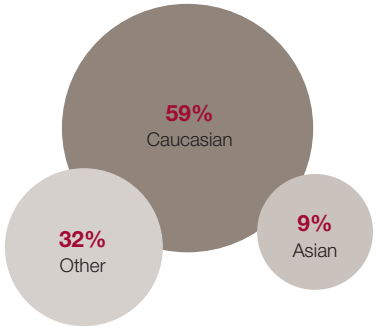
IS GRADUATES



OVERALL U.S. GRADUATES***



COMPUTER SCIENCE GRADUATES**



The **Asian ethnic representation** in IS is more than **4 times higher** than in Computer Science*

* Bachelors in Computer Science, NSF 2012. ** Bachelors in Computer Science, NSF 2012.
*** Bachelor's degree awarded, NSF 2012.

Salaries & Offers
by INDUSTRY

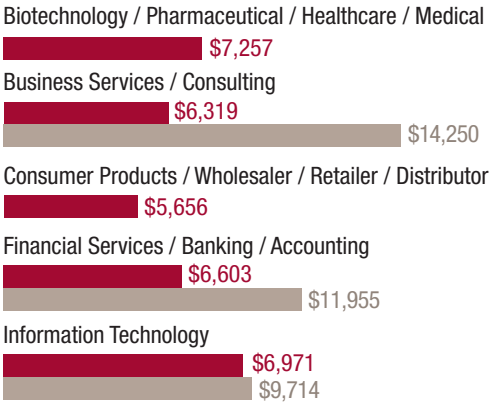
Legend
- Bachelor's
- Master's

About the Data: Industries with less than 4% responses omitted below.

SALARY BY SIZE OF ORGANIZATION
Bachelor's Students

VERY SMALL	$48,083	1-100 Employees
SMALL	$52,183	101-1,000 Employees
MID-SIZED	$53,894	1,001-5,000 Employees
LARGE	$55,083	5,001-10,000 Employees
VERY LARGE	$61,646	10,001 or more Employees

BONUS RECEIVED BY INDUSTRY
*Bachelor's & Master's Students**



*Data from students who received bonuses.

INDUSTRY	2013 % Change
BIOTECHNOLOGY / PHARMACEUTICAL / HEALTHCARE / MEDICAL	
$58,591	no data
BUSINESS SERVICES / CONSULTING	
$60,354	+3%
$70,241	+6%
CONSUMER PRODUCTS / WHOLESALER / RETAILER / DISTRIBUTOR	
$55,537	+2%
FINANCIAL SERVICES / BANKING / ACCOUNTING	
$58,424	0%
$67,556	+11%
INFORMATION TECHNOLOGY	
$60,272	+6%
$70,189	0%
INSURANCE / REAL ESTATE / LEGAL	
$55,826	-7%
MANUFACTURING	
$55,710	+3%
$74,532	no data

Salaries in nearly **every industry increased**, except Insurance / Real Estate / Legal, which saw a 7% decrease.

Master's students who were hired in **financial services** saw the **largest increase** at 11%.

Salaries & Offers
by JOB CATEGORY

Legend
Bachelor's
Master's

About the Data: Job categories with less than 4% responses omitted below.

JOB CATEGORY		2013 % Change
COMPUTER SYSTEMS ANALYSTS		
	$59,494	-1%
	$61,340	-2%
DATA ANALYTICS		
	$57,750	no data
	$68,815	no data
INFORMATION SECURITY ANALYSTS		
	$54,708	-6%
	$67,355	no data
INFORMATION TECHNOLOGY ADVISORS / CONSULTANTS		
	$63,219	no data
	$73,276	no data
INFORMATION TECHNOLOGY AUDITORS		
	$57,583	no data
PROJECT MANAGERS		
	$62,956	no data
SOFTWARE / APPLICATIONS DEVELOPERS		
	$56,994	-1%
	$80,350	+30%

Salaries for **software developers** graduating from Master's programs **increased by 30%.**

Job Skills & Search

Bachelor's students secured the same number of interviews as master's students but submitted **61% fewer** applications.

Bachelor's Students

11.9 Applications → **4.7** Interviews

Master's Students

30.4 Applications → **5** Interviews

Students with higher confidence submitted **fewer** applications for jobs.

Students who **received job offers** spent almost **20% more time** on their job search.

Master's students in universities that have a professional development department received salaries nearly **$10,000 higher**.

On average, IS Students were **confident** about both the **job market** and their own searches rating both an **average of 5.8** on a 7-point scale.

Skill ratings improved in all categories compared to 2013, with some of the biggest **gains in leadership** and **collaboration**.

Students' **self-assessed knowledge** of Securing Data and Infrastructure improved from 2013 but remained the **weakest knowledge area**.

Higher self-rated skill and knowledge levels accounted for as much as a **$10,737 increase in salary**.

IS students are aligned with industry needs. The **skills and attributes** that employers rate the most important match the **self-rated high ratings** of IS students.

Most Important Attribute: Leadership* | **Student Self-Assessment: 4.6** (on 5-point scale)

Most Important Skill: Communication* | **Student Self-Assessment: 4.9** (on 5-point scale)

*NACE, 2016

Job Search
HOURS & RESOURCES

Legend
0-25% | 26-50% | 51-75% | 76-100%

About the Data: Department size based on number of full time students (FTE). Very small < 143 FTE, Small 144-212 FTE, Medium 213-335 FTE, Large > 337 FTE

DEPARTMENT RESOURCES EFFECT ON OFFERS

Access to the following **three resources** had the greatest effect on whether or not student's **received an offer**.

STUDENT ORGANIZATIONS

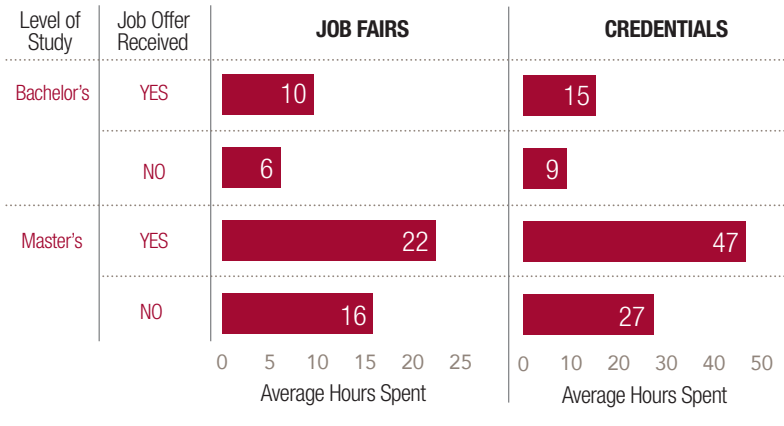
RESUME BOOK

CAREER COUNSELING

DEPARTMENT SIZE AND RESOURCES

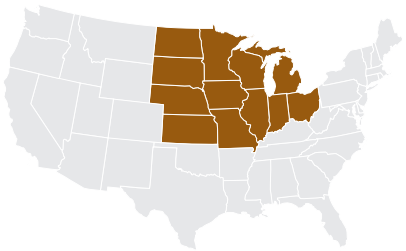
RESOURCE AVAILABILITY	Department Size: VERY SMALL	SMALL	MEDIUM	LARGE
Student Organization	100%	100%	100%	94%
Job Offer Counseling	100%	67%	80%	77%
Internship Placement	25%	100%	60%	59%
Job Databank	25%	67%	40%	59%
Resume Book	25%	33%	20%	47%
Career Fairs	25%	0%	40%	59%
Résumé Development	25%	0%	20%	53%
Etiquette Training	25%	0%	0%	41%
Soft Skills Development	25%	0%	20%	53%
Mock Interviews	0%	0%	0%	41%
Career Counseling	75%	67%	80%	77%
Networking Events	100%	100%	60%	94%
E-Portfolios	0%	33%	0%	18%
Speaker Series	100%	67%	60%	94%
Mentoring Program	50%	67%	60%	82%

HOURS SPENT ON JOB SEARCH
Bachelor's & Master's Students

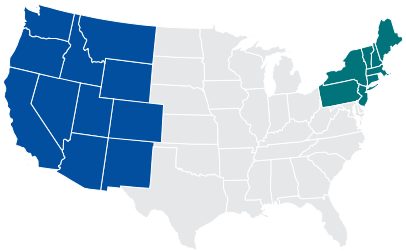


Job Market Confidence
by REGION

Legend
West
South
Midwest
Northeast

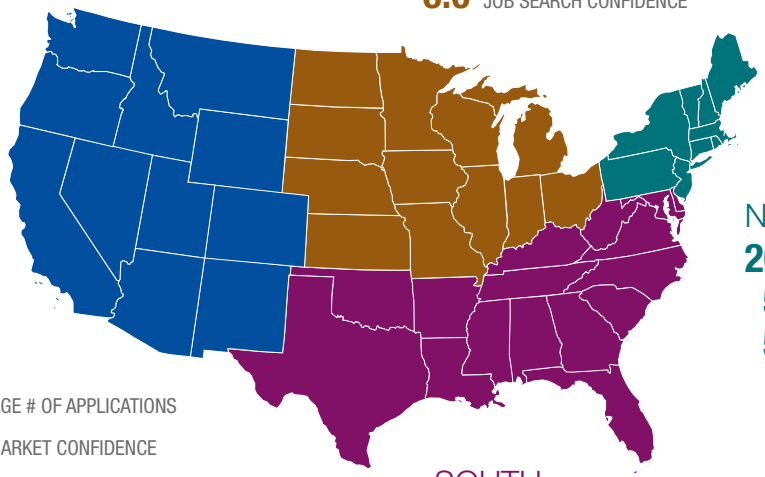


Students in the **Midwest** had the **highest** job market **confidence**.



Job applications by students in the **Northeast** and **West increased by an average of 61% in 2015** compared to 2013.

JOB MARKET & SEARCH CONFIDENCE BY REGION
Bachelor's & Master's Students



MIDWEST
10.4 AVERAGE # OF APPLICATIONS
6.2 JOB MARKET CONFIDENCE
6.0 JOB SEARCH CONFIDENCE

NORTHEAST
20.4 AVERAGE # OF APPLICATIONS
5.7 JOB MARKET CONFIDENCE
5.6 JOB SEARCH CONFIDENCE

WEST
22.2 AVERAGE # OF APPLICATIONS
5.7 JOB MARKET CONFIDENCE
5.4 JOB SEARCH CONFIDENCE

SOUTH
17.0 AVERAGE # OF APPLICATIONS
5.9 JOB MARKET CONFIDENCE
5.8 JOB SEARCH CONFIDENCE

Job market and search confidence rated on a 7-point scale.

Knowledge Level & Skills
CONFIDENCE VS. SALARY

Legend
- High Skill Level (3.33-5.00)
- Medium Skill Level (1.66-3.32)
- Low Skill Level (0-1.65)

SKILLS	Bachelor's		Master's	
	2013	2015	2013	2015
DOMAIN KNOWLEDGE				
Improving organizational processes *Process analysis, change management, and project management*	3.2	4.15	3.4	4.3
Exploiting opportunities created by technology innovation *Converting IT innovations into organizational value, analyzing problems, and designing solution alternatives*	3.1	4.05	3.4	4.3
General models of business *Business process design, organizational theory, business models, strategy*	3.4	4.45	3.5	4.45
Business functions *Finance, accounting, marketing, operations, behavior, business law*	3.4	4.43	3.3	4.29
Evaluation of business performance *Analysis of organizational, individual, and team performance, business analytics*	3.4	4.43	3.4	4.48
IS KNOWLEDGE				
Understanding and addressing information requirements *Converting IT innovations into organizational value, analyzing problems, and designing solution alternatives*	3.4	4.26	3.7	4.6
Designing and managing enterprise architecture *Representing and analyzing organizational business models, data, applications, and IT architecture, applying networking technology and data centers, and utilizing industry standard frameworks*	2.7	3.61	3.0	3.87
Identifying and evaluating solution and sourcing alternatives *Generating high-level design alternatives, identifying, sourcing, and acquiring operationally, financially, and technically feasible solutions, reusing or building on existing components, envisioning integrated systems*	2.7	3.72	3.0	4.11
Software development *Computer programming, client-server applications, server-side scripting, client-side scripting, macros, widgets, plug-ins, multiple programming languages, prototyping solutions, integrated development environments*		3.48		3.99
Securing data and infrastructure *Protecting high-level data and infrastructure, identifying solutions to protect the organization*	2.4	3.32	2.7	3.83
Understanding, managing, and controlling IT risks *Identifying, managing, and controlling IT-related risks*	2.8	3.75	2.9	4.07
FOUNDATIONAL SKILLS				
Leadership and collaboration *Leading cross-functional global teams, managing distributed/virtual work, working in diverse teams*	3.5	4.59	3.4	4.63
Communication *Analyzing archival materials, writing reports and presentations, using virtual collaboration/communication tools, giving presentations*	3.8	4.88	3.9	4.9
Negotiation *Negotiating with users about funding, resources of time, staff, and features, service levels, quality and performance deliverables, facilitating competing internal interests*	2.9	3.97	3.9	4.87
Analytical and critical thinking, including creativity and ethical analysis *Ethical and legal implications of complex situations, quantitative techniques, innovation, and creativity*	3.5	4.58	3.9	4.87
Mathematical foundations *Statistics and probability, construct algorithms*	2.8	3.82	3.1	4.28

Source: Topi et al. "IS 2010 Curriculum Guidelines..." CAIS, 2010

Legend

- High Skill Level (3.33-5.00)
- Medium Skill Level (1.66-3.32)
- Low Skill Level (0-1.65)

SKILL LEVEL DESCRIPTIONS

0 - NO KNOWLEDGE

1 - AWARENESS
Define, list characteristics, name components, list advantage/disadvantages

2 - LITERACY
Can compare and contrast, explain, execute, define capabilities, describe interrelations, describe framework

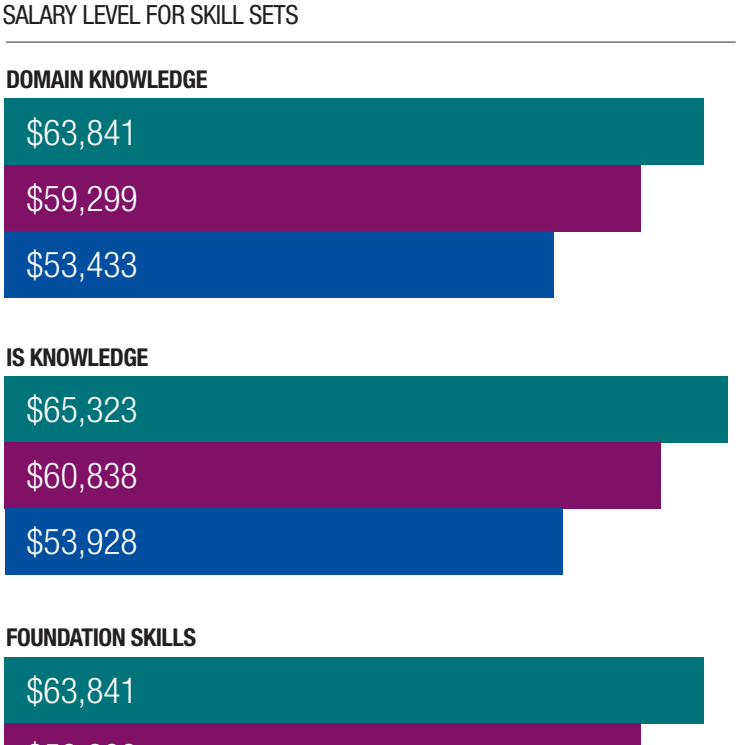
3 - CONCEPT/USE
Can use, communicate the idea of, form abstraction, extrapolate, list concepts, comprehension and ability to use the knowledge

4 - DETAILED UNDERSTANDING/ APPLICATION ABILITY
Detailed understanding, search for and apply correct solution, design and implement, apply the principles, can select the right thing and use

5 - ADVANCED
Develop, originate, construct, evaluate, judge relative value

Source: Topi et al. "IS 2010 Curriculum Guidelines..." CAIS, 2010

SALARY LEVEL FOR SKILL SETS



Master's students rated their understanding of solutions and sourcing alternatives, data security and infrastructure, and IT risks much higher than in 2013.

Bachelor's students saw the biggest gains in foundational skills, such as communication, negotiation and critical thinking.

ABOUT THE AUTHORS

Dr. Munir Mandviwalla is Associate Professor and founding chair of Management Information Systems at the Fox School of Business, Temple University. He is also the Executive Director of the Institute for Business and Information Technology. Dr. Mandviwalla has published articles on collaborative systems, social media, virtual teams, software training, peer review, globalization, and universal access and use. His most recent work includes studies of social media in politics, social media strategy, and broadband policy. He is currently working on applying and studying the use of social media on higher education using complex adaptive systems theory. His publications have appeared (or are scheduled to appear) in *Management Information Systems Quarterly (MISQ), Information Systems Research (ISR), ACM Transactions on Computer Human Interaction, Journal of Management Information Systems, Journal of Organizational Computing and Electronic Commerce, Decision Support Systems, Small Group Research, Communications of the ACM (CACM), Communications of the Association for Information Systems, Public Administration Review,* and *Information Systems Journal*. His work has been supported by grants from the National Science Foundation (NSF), SIM Advanced Practices Council, Bell Atlantic, IBM, Microsoft Corporation, CIGNA Corporation, Advanta Corporation, Lotus Development Corporation, and Lilly Endowment, Inc. In 2000, IBM selected him for their Faculty Partnership Award in recognition for contributions to E-Business teaching and research. In 2002, The Claremont Graduate University recognized him with their Alumni Hall of Fame award.

Dr. Crystal Harold is an Associate Professor in the Department of Human Resource Management at the Fox School of Business, Temple University. Her research focuses on issues related to employee recruitment (in particular the role of PE fit and fairness) and the impact of management practices and characteristics that engender perceptions of workplace fairness and counterproductive behaviors. Her work appears in top OB/HRM outlets including the *Journal of Applied Psychology, Personnel Psychology, Journal of Management,* and *Journal of Organizational Behavior*. She serves on the editorial boards of *Personnel Psychology* and the *Journal of Occupational and Organizational Psychology*. Findings from her research have been discussed in numerous media outlets, including the CBS Early Show, Strategy + Business, The Telegraph, and The Chronicle of Higher Education. Dr. Harold was awarded a 2005 APA Dissertation Award and the HUMRRO Fellowship in I/O Psychology. In recognition of her research and teaching accomplishments, she was recently appointed a Paul Anderson Research Fellow and Dean's Teaching Fellow, and was awarded Adrisani-Frank Undergraduate Teaching Award.

David Yastremsky is a rising senior studying Management Information Systems at the Fox School of Business. He is a Presidential Scholar at Temple in the Fox and University Honors programs, consistently placing on the Dean's list. During his time in college, he served as president of Temple's Toastmasters chapter, director in the Business Honors Student Association, and treasurer of his residence hall. He views Toastmasters as his biggest success, since he led an 11x increase in certifications and 2.5x increase in membership through initiatives such as a mentorship program and club competitions. These accomplishments earned the club the designation of Select Distinguished Club for the first time in chapter history. Professionally, David worked within the MIS department as a teaching assistant and e-portfolio coordinator. He interned in TD Bank's North American Fraud Operations, where he programmed a script that saved over $200,000 in two weeks and continues to detect risks. In the spring of 2016, he interned in the Securities and Exchange Commission's Student Honors Program in Philadelphia, analyzing risk areas such as due diligence and valuation for investment firms with under $300B in assets. In the summer of 2016, David will intern in Deloitte's Washington, D.C. office. David plans to go into consulting after graduation.